PROLOGUE

The course of the mighty Ohio River has changed many times during the eons of geologic history, but the 981-mile long course of the Ohio as it existed in 1975 remained very much the same as it was when European explorers first discovered the river about three centuries ago. But doubtless these early explorers, were they to revisit the Ohio Valley in 1975, would not recognize the modern Ohio River and many of its tributary streams as being the same rivers they viewed in the seventeenth century, for between 1675 and 1975 a revolutionary transformation occurred in the Valley and on the rivers.

In 1675 the Ohio Valley was, for the most part, covered by virgin forests and dense vegetation; the only human habitations were small, isolated Indian villages; and the sole commerce on Ohio Valley streams was a limited traffic carried on in primitive canoes and dugouts. The Ohio River and its tributaries were wild, scenic rivers, alternately calm and turbulent, subject to great fluctuations ranging from less than a foot deep at extreme low water to more than seventy feet deep at flood time. While these uncontrolled streams were doubtless quite beautiful and clear-running rivers, the many obstructions in their channels, notably the limestone ledges at the Falls of the Ohio, made even primitive navigation hazardous; and the wide range of stream fluctuations from low water to flood stages made living and working on their banks perilous, even to the sparce Indian population dwelling in the flood plains.

By 1975 the dense forests had largely disappeared from the Ohio River Basin; immense industrial centers and urban population concentrations sprawled along the flood plains where once only a few Indians lived; commerce on Ohio Valley waterways was transported chiefly in enormous tows of barges pushed by powerful diesel tow-boats. The Ohio River and several of its tributaries were regulated by slackwater, lock-and-dam projects to provide more than a nine-foot depth for navigation at all times; and, while fluctuations resulting from a lack, or overabundance, of precipitation still occurred in 1975, the extreme variations in water flow had been leveled out by great reservoir projects which augmented stream flow during low-water periods and reduced the height of flood crests.

As in 1675, the Ohio River in 1975 was still formed by the cold waters of the Allegheny River rushing down from near Lake Erie to unite with the Monongahela rolling down from the Appalachians. The largest tributaries still joined the Ohio from the south and east: from Pittsburgh to Louisville, the Little Kanawha, Great Kanawha, Big Sandy, Licking, and Kentucky rivers dropped from mountain sources to a juncture with the Ohio; below Louisville, warmer waters of the Green, Cumberland, and Tennessee rivers linked the Ohio Valley with the sunny South. The major tributary streams which united with the Ohio from the north — the Beaver, Muskingum, Scioto, Miami, and Wabash rivers — still found their sources near the Great Lakes. These streams, and hundreds of smaller tributary streams, joined together to produce the mighty Ohio River and link the more than two-hundred-thousand square-mile watershed of the Ohio River Basin with the remainder of the inland waterways system of America. But, though an accurate map of the Ohio Basin in 1675 might have resembled a map of the same region in 1975,

very great changes in the regimen of the streams had been effected to meet the demands of a mature and technologically oriented American society.

This is the story of those changes as they were conceived and implemented by the Louisville District, Corps of Engineers, United States Army, and its predecessors — the Cincinnati Engineer District, the Louisville and Portland Canal Company, the Office of Western River Improvements, and individual Army Engineer officers on mission assignment in the Ohio Valley.

The Louisville Engineer District, established on May 11, 1867, has for more than a century engaged in programs designed to enhance the human environment in the Lower Ohio Basin through engineering and technology. Prior to 1867, a quasi-public corporation, the Louisville and Portland Canal Company, created in 1825, was responsible for the improvement of navigation around the hazardous Falls of the Ohio at Louisville; and the Office of Western River Improvements, Corps of Engineers, with offices at Louisville, supervised the improvement of navigation on the Ohio River and other major waterways in the interior of America from about 1824 to 1860. And prior to 1824, even as early as 1766, individual Army Engineer officers performed topographic and hydrographic surveys and completed military missions in the Lower Ohio Valley.

The history of the Louisville Engineer District began in the late eighteenth century when French, British, and American Army Engineer officers constructed fortifications in the Ohio River Basin, surveyed and mapped the Basin, and studied the hydrology and navigational problems of the rivers. The first missions of Army Engineers in the Ohio Valley had therefore a military character, in support of military units operating on the trans-Appalachian frontier and as a contribution to the security of the first settlements in the Basin, but the work of these early Engineers also had civil applications in that the maps prepared for military purposes became the basis for the numerous guides printed for the pioneers on the way to new homes on the frontier.

About 1824 the officers and civilian personnel of the Corps of Engineers, United States Army, were assigned the mission of improving navigation on the Ohio River and other major waterways to benefit a growing flatboat, keelboat, and steamboat commerce. From 1824 to 1860, this navigation improvement mission was performed intermittently by an Engineer office at Louisville commonly known as the Office of Western River Improvements, directed by Captain Henry M. Shreve and Colonel Stephen H. Long.

From 1860 to 1865, the improvement of navigation was temporarily suspended while Engineer officers and personnel, both Union and Confederate, concentrated on performance of a military mission. But in 1866 and 1867 the project for improving navigation on the Ohio River was resumed; and the Louisville District was established, responsible at first chiefly for the enlargement and improvement of the canal around the Falls of the Ohio at Louisville, but eventually in charge of the improvement of all streams, except the Cumberland and Tennessee rivers, in the Lower Ohio Basin.

In the late nineteenth and early twentieth centuries, in addition to improvements at the Falls of the Ohio, the Louisville District was active in projects designed to provide dependable navigable depths through the construction of canalization, slackwater systems of locks and dams on the main stem of the Ohio River

and several of its tributaries. In 1936, after floods repeatedly devastated the growing population and industrial centers in the Ohio Basin, the Louisville Engineer District was assigned the mission of developing and implementing plans to control floods and reduce flood damages to the human environment within the District's geographic jurisdiction. As a result of numerous expansions of the scope of the flood control mission, as directed by Congress, the Louisville Engineer District was participating in 1975 in an extremely complex and challenging program to develop water resources for multiple purposes — flood control, navigation, water supply, recreation, fish and wildlife conservation, water quality improvement. This comprehensive program for the development of water and related land resources, as it was planned and implemented between 1936 and 1973, was having revolutionary effects on living standards and life quality in the Ohio River Basin, as were similar plans and developments elsewhere in the nation.

As has been the case with many other institutions, the Louisville Engineer District had its beginnings with individuals on special assignments, progressed through a phase in which operations were performed by a small staff directed by a few colorful and independent men — Henry M. Shreve, Stephen H. Long, Godfrey Weitzel, and William E. Merrill — and became, in the twentieth century, a complex, fully staffed organization — a mature institution in which individual personnel were subordinate to and integral components of a corporate-type entity, the "District."

Extending over a period of about two centuries, characterized by increasing complexity of functions and administrative organization, the history of the Louisville Engineer District assumes a somewhat epic character, but retains continuity through several major recurrent themes. This history of the District will focus chiefly on the historic dual military-civil works missions of the Corps of Engineers as reflected by developments within the present Louisville District boundaries; on the administrative and institutional development of the Corps of Engineers as revealed by events in the Louisville District; and on the gradual expansion of the Corps civil works mission from surveying-mapping activities in the late eighteenth and early nineteenth centuries, to the improvement of navigation in the nineteenth and early twentieth centuries, to flood control in the mid-twentieth century, and finally to comprehensive water resource development and the preservation of environmental quality in the late twentieth century. Particular reference will be made to developments at the Falls of the Ohio, the major obstruction to navigation on the Ohio River, from the early studies of the obstructions by Army Engineers, to the activities of the Louisville and Portland Canal Company, 1825-1874, and, at last, to McAlpine Locks and Dam, the structure in place at the Falls of the Ohio in 1975 as an element of the Ohio River Navigation Modernization project.

Before beginning the lengthy, complex, sometimes humorous, and frequently tumultuous history of the Louisville Engineer District, a brief survey of the history of the Corps of Engineers and review of the Corps organization as it existed in 1975 should doubtless be provided to clarify questions which may arise.

French and British Army Engineers operated in North America, a few in the Ohio Valley, prior to the American Revolution. Some of these Engineers joined the Corps

of Engineers, United States Army, when it was established on June 16, 1775, at the outset of the Revolution. The Corps of Engineers went through several reorganizations during its early history; and the modern Corps of Engineers organization dates from an act of Congress of 1802. During the early nineteenth century a distinction was made between Engineers who performed topographic mapping missions and Engineers who directed the construction of fortifications; therefore, in 1813 a Topographical Bureau was established which eventually became the separate Corps of Topographical Engineers. The Corps of Topographical Engineers was merged again with the Corps of Engineers in 1863, when the exigencies of Civil War required that Engineer officers perform both topographic and construction functions. The Army Engineers were first assigned the improvement of navigation on inland waterways in 1824; the Corps has retained this mission, and, in the twentieth century, this limited mission was expanded by Congress to include many other functions relating to water resource development.

The Chief of Engineers, United States Army, with headquarters in Washington, D. C., was, in 1975, the systems manager for engineering support for the Army and also directed the Army Civil Works Program. Prior to 1888, individual Engineer officers reported operations at projects in their charge directly to the Office of the Chief of Engineers (OCE); but in 1888 the Corps decentralized Division-District organization was adopted. Corps Divisions and Districts were essentially administrative and construction field offices; in 1975 there were thirteen Division and thirty-seven District offices, some with jurisdiction for projects outside the continental United States.

Corps activities in the Ohio River Basin were directed in 1975 by the Ohio River Division (ORD), established in 1933 at Cincinnati, Ohio. The Ohio River Division Engineer, usually a General officer, and his staff at Cincinnati provided overall supervision for Engineer operations within the Basin. Within the boundaries of Ohio River Division were four subordinate offices — Engineer Districts — with headquarters at Pittsburgh, Pennsylvania; Huntington, West Virginia; Nashville, Tennessee; and Louisville, Kentucky. Each District was responsible for Corps activities in a geographic section, conforming in general to specific watersheds, of the Ohio River Basin; each was commanded by a District Engineer, who commonly held the rank of Colonel in 1975, reporting to the Division Engineer; and each was staffed primarily by civilian career employees.

The Louisville District's geographic area of jurisdiction could be described as the Lower Ohio River Basin, inclusive of the Wabash, Miami, Licking, Kentucky, Salt, Green, Tradewater, and smaller watersheds, and exclusive of the Cumberland and Tennessee basins. The District staff included a District Engineer, a Deputy District Engineer, military assistants of the Corps of Engineers, and civilian personnel. Employees of the District were stationed either at the District Office in Louisville, or at project management, operation, and construction sub-offices located throughout the District. The District administrative structure included Engineering Division, Planning Division, Operations Division, Real Estate Division, Supply Division, and appropriate branches, plus such specialized units as Office of Counsel, Office of Administrative Services, Personnel Office, and Safety Office. Certainly this complex organiza-

tion was quite different from nineteenth- and early twentieth-century Engineer offices, when Corps functions in a District area were frequently performed by a single Engineer officer, a small staff of clerks and draftsmen, and a few Assistant Engineers in charge of various projects; but the District organization of 1975 was an outgrowth of the earlier administrative structure and was still performing the same functions first assigned to the Corps in the nineteenth century in addition to the duties required by the expanded Corps water resource program.

The information provided above should furnish sufficient background for fuller comprehension of the story of the Louisville Engineer District — the history of Army Engineer activities at Louisville, the "Falls City," and in the Lower Ohio Basin. It is a story which holds intrinsic interest for each citizen of the Ohio Valley — the "crossroads of America" — because the life of each resident of the region has been touched, directly or indirectly, by the activities of the Louisville District, Corps of Engineers, United States Army.